

IV. *Some notes on the habits of Nanophyes durieui*, Lucas, as observed in Central Spain. By GEORGE CHARLES CHAMPION, F.Z.S., and DR. THOMAS A. CHAPMAN, M.D., F.Z.S., with a description of the larva and pupa by DR. T. A. CHAPMAN, M.D.

[Read Nov. 19th, 1902.]

PLATE V.

DURING a recent visit to Bejar, Central Spain, June 26th–July 17th, 1902, we noticed numerous large fleshy excrescences or galls on the stems of a *Cotyledon*, a plant growing abundantly between the crevices of the stone walls in the outskirts of the town. Many of these galls, on examination, were found to contain specimens of a *Nanophyes*, subsequently identified as *N. durieui*, Lucas, in the larval, pupal, and imaginal condition. The beetles, at the beginning of July, were mostly immature, and we therefore contented ourselves by bringing home a supply of the galls, from which, during August and September, quite two hundred examples have emerged, accompanied, in September, by a few *Apion sedi*, Germ. In the accompanying plate an illustration is given of the perfect insect, the larva, pupa, and gall, the beetle only having been previously figured by Lucas, who, in his description of the species, from a few specimens found at Oran, Algeria, merely states that the insect passes its metamorphosis in swellings on the stems of *Cotyledon (Umbilicus) horizontalis*. Our observation, therefore, is not new, still it is interesting as confirming the statements of MM. Lucas and Durieu, and will no doubt induce entomologists to search for the insect in other European localities. *N. durieui* is recorded from Southern Spain in Heyden, Reitter and Weise's "Catalogus Coleopterorum Europa:" (1891), but on what authority we know not, as MM. Brisout and Xamheu, both of whom have described or noticed the species, simply refer to Lucas' work. M. Xamheu (Le Naturaliste, 1901, pp. 224, 225) has recently described the larva and pupa of three species of the genus: *N. lythri*, Fabr., on *Lythrum salicaria*; *N. telephii*, Bedel, on *Sedum telephium*, an insect that is

not unlikely to occur in England, if its food-plant was searched in various places; and *N. hemisphaericum*, Oliv., on *Lythrum hyssopifolium*. He also notes (*loc. cit.*) the larva of *N. tamarisci*, Gyll., as attacking *Tamarix*, that of *N. siculus*, Boh., on *Erica scoparia*, and that of *N. duricui*, Luc., on *Cotyledon (Umbilicus) pendulinus*. The habits of *N. telephii* appear to be very similar to those of *N. duricui*, both species making galls on the stems of the plants a little above the roots. *Apion sedi* has not, we believe, been previously recorded as attacking *Cotyledon*, though it is known to pass its metamorphoses in the stems of *Sedum*. The galls formed by *N. duricui* are very conspicuous, owing to their large size. They are somewhat kidney-shaped, several of them being often clustered together, green in colour, more or less streaked with reddish or purple, and marked here and there with a minute scar, showing the original punctures made by the parent insect in the stem of the plant. The beetle is attacked by a small Chalcid, of which a number of specimens emerged from the galls.

*The larva of Nanophyes duricui* is a footless maggot very like many other weevil larvæ. Its length is, or rather would be if straightened out, about 3.0 mm., but as it lies curled up into an arc of about 100 degrees, its actual measure when full-grown is a little over 2.0 mm. The thoracic segments are decidedly thicker than the others, and here the diameter of the larva approaches 1.00. In the preserved specimens examined to find them, no spiracles can be detected, if they exist they are very small and have no coloured chitinous surroundings. The larva is white or colourless, except the jaws and some other chitinous portions in connection with the mouth parts. There is a very definite ventral prominence of each of the thoracic segments representing the true legs, but no actual fore-legs exist; at what may be supposed to be the site of each, is a rather stronger hair than exists anywhere else on the larva, but there is nothing to show whether this surviving hair corresponds to one that naturally (*i. e.* where the fore-legs are present) exists at the base of the fore-legs, or is one of those arming some joint of the fore-leg itself. The marginal flange is well developed in three definite prominences on each segment, a lower one that is almost ventral, rather flat and well delimited, a median one, full and rounded and almost continuous with the next above, which forms the

lower part of the dorsal area, but is marked off by a longitudinal depression from the portion next above it. This carries at least on the hinder abdominal segment a minute colourless bristle. The sulci above this are rather complicated; they mark off an anterior and posterior subsegment, of which the anterior is dorsally the higher, each carries a minute bristle, the anterior the larger—one or two more are present on the prothorax. The intersegmental sulcus branches downwards and there is also a small eminence, at the anterior margin of the segment immediately above the flange. The 10th abdominal segment cannot be seen, but is probably present, retracted. The hairs or bristles made out are very small and very colourless, and cannot be detected without considerable search, so that it is possible that others exist; of these others the only ones supposed to have been observed are abdominal ones continuing the thoracic pedal series.

The head is comparatively large and well developed, rounded. Looked at from the front there is a median suture, losing itself below, without definitely ending in sutures marking off a clypeus. The head is faintly if at all tinted, but the clypeal region has some faint fuscous clouds. The front ends below in a brown chitinous margin, arched upward centrally over the labrum, and again laterally into rather more than semicircles round the antennal origins. In the area projecting between the labrum and antenna, a short bristle arises, and another, still in the clypeal region, higher up and nearer the middle line. Marginally (as seen from in front) are three bristles on each side at about equal intervals, the lower and smaller behind the antenna, and the highest one about half-way to the vertex.

The antennæ have a very large colourless circular basal region, bounded by the chitinous semicircle already alluded to above, a less marked chitinous margin behind, and the bases of the jaw in front. The antenna itself, arising in the centre of this area, is very minute and slender, and deflexed, and appears to consist of a large basal and a minute terminal joint. The jaws are large and strong, broad at base, about half that width at their cutting margin, which consists of two sharp teeth below (as seen from front), separated from another above by a smooth hollowed margin.

The maxilla is full and fleshy, has two fine bristles

externally and in front a palpus rising from the middle of a clear area surrounded by a brown chitinous circle, and apparently of two joints, below this and more central is the labrum formed of two round processes each having in front a minute palpus, looking (in front view) like two small concentric circles. Below this the gular region is swollen and carries two bristles on either side.

*The pupa of Nanophyes duricui* has much the appearance and outline of the larva, is rather shorter and wider, and is absolutely without any hard, coloured, or chitinous parts. Whilst the dorsum has much the same curve as in the larva, the ventral aspect is nearly straight, the (larval) concavity being filled by the various projections of the appendages. The head is deflexed, and the rostrum extends downwards ventrally, to about the middle (antero-posteriorly) of the pupa, the anterior end of the pupa being the front margin of the prothorax. From each side of the rostrum extend outwards, first at its base the antenna, then the first femur, and against it the tibia completely flexed, then similarly the second femur and tibia, the tarsi (1st and 2nd) lie close against the rostrum, the end of the second being slightly beyond it. The femoro-tibial articulation of these legs lies outside the elytra cases, which however, with the wing cases directed backwards, ventrally, and finally inwards cover the third legs, except the femoro-tibial articulation which just projects dorsally from beneath them. The wings nearly meet in the middle just beyond the end of the rostrum.

On the prothorax are a series of bristles, remarkable in being perched each on the summit of a conical projection, giving an armed appearance to the front of the pupa. These appear to be arranged as a row towards the anterior border and another towards the posterior border of the segment, two on either side in the front and four in the back row, but the marginal two of the latter are not so directly placed in the row as to prevent their position being otherwise described.

The antennæ have a thick basal piece lying against the head or rostrum, from the anterior (position if the head were extended) end of this the flagellar joints extend outwards as above noted, to the number of 10 (or 11) ?, each being larger than the preceding. The joints are somewhat angular, and at about the fourth or fifth the angles appear as definite projections; on the fifth from the

extremity these appear as one or two very definite mammillary projections, and on the three next they form on each a ring of seven or eight sharp projecting angular points, with picturesque effect, reminding one strongly of the similarly studded clubs and chained balls anciently used as weapons. Very similar conical projections occur on the tibiae, to the number of three or four on each, and a hair at the exposed extremity of the first and second femora. Two pairs of conical points are present on the front of the head (or base of rostrum) basal to the antennal origin. Some very minute hairs are with difficulty seen on the abdominal segments. There is a rather larger conical eminence or two between the projecting elytral bases on the dorsal centre of the mesothorax.

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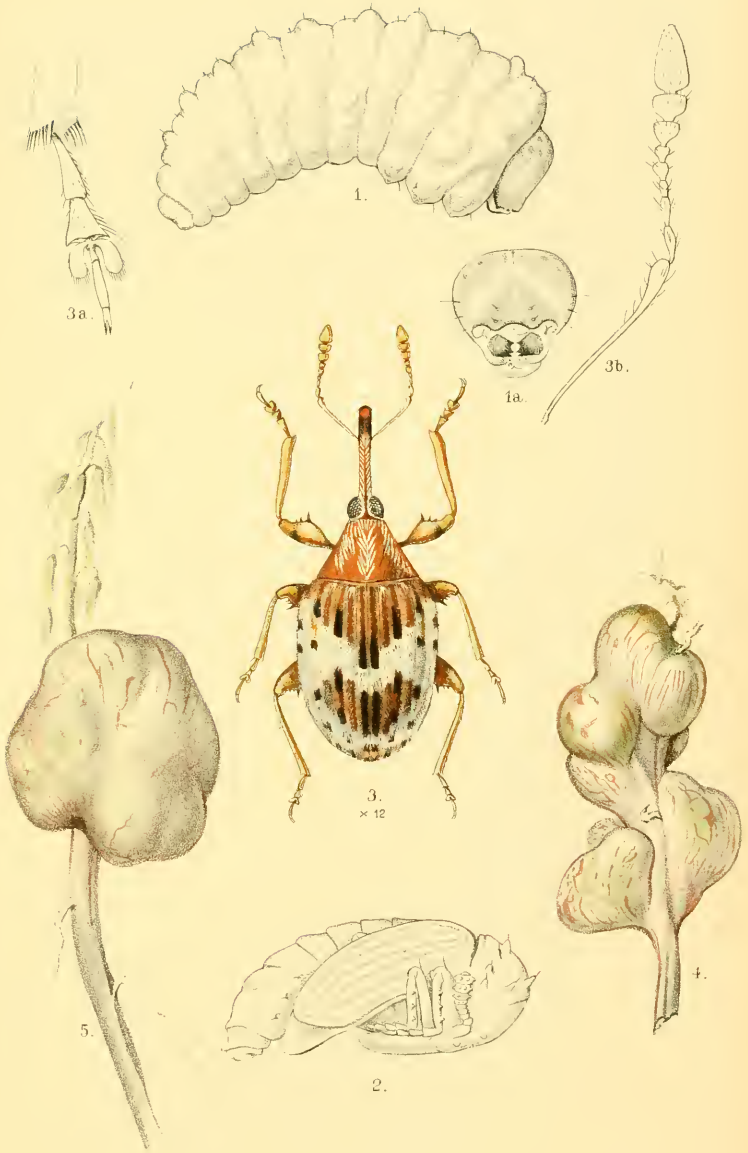
EXPLANATION OF PLATE V.

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FIG. 1. *Nanophyes duricui*, larva,  $\times 15$ .

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|-----|---|---|------------------------|
| 1a. | „ | „ | „ head, from in front. |
| 2.  | „ | „ | pupa, $\times 15$ .    |
| 3.  | „ | „ | imago, $\times 12$ .   |
| 3a. | „ | „ | hind tarsus.           |
| 3b. | „ | „ | antenna.               |

4, 5. The galls made by the beetle on the stems of *Cotyledon*, natural size. N.B.—These figures do not show the minute scars that suggest that each egg is separately laid.



*Nanophyes durieu*,  
with its larva, pupa &c

E. Wilson, Cambridge.